USE OF INTELLIGENT SOLUTIONS FOR URBAN DEVELOPMENT

Abstract
The concept „smart planet" refers at intelligence which is being infused into the systems and processes and makes the world work better. We think that smarter means to infused intelligence into things which no one would recognize as computers: cars, appliances, roadways, even natural systems such as agriculture and waterways.
To build a smart planet must to start from three main ideas: instrument the world's systems, interconnect the world's systems and make the world's systems intelligent.
This paper analysis where we can use the smart systems in our city and if these are a significant part of future locality development

Keywords: smart solutions, smart planet, smart locality, urban development

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UTILIZAREA DE SOLUŢII INTELIGENTE PENTRU DEZVOLTAREA URBANĂ

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Rezumat
Conceptul "smart planet" se referă la inteligenţă care este utilizată în sisteme şi procese şi face lumea să îşi desfăşoare activităţile mai bine. Noi credem că mai inteligent înseamnă a utiliza soluţii inteligente în activităţi pe care nimeni nu ar recunoaşte ca folosesc calculatoare: masini, aparate, drumurile, chiar sisteme naturale, cum ar fi agricultura şi căile navigabile.
Pentru a construi o planetă inteligent trebuie să începem de la trei idei principale: instrumentate sistemelor folosite, interconectarea sistemelor şi realizarea de sisteme inteligente.
Această lucrare analizează unde putem folosi sistemele inteligente în oraşul nostru şi dacă acestea sunt o parte semnificativă de dezvoltare a localităţii în viitor.

Cuvinte cheie: soluţii inteligente, planetă inteligentă, oraş inteligent, dezvoltare urbană

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1. INTRODUCTION

Paper aims to analyze the smart/intelligent solutions whitch can be use for urban developemnt.

The first part will present the elements of a smart planet. By smarter, we mean that intelligence is being infused into the systems and processes that make the world work—into things no one would recognize as computers: cars, appliances, roadways, power grids, clothes, even natural systems such as agriculture and waterways.

The second part presents the characteristics of smart city and we compared European model with Chinese model of implementing intelligent solution in urban area.

The urban population of the world is estimated to increase (Dirks and Keeling, 2009). About 65% of the world population will be urban until 2025. Problems due to urbanization are becoming increasingly important and require intelligent solutions especially in the areas that are considered primary. We can use intelligent systems to improve the quality of life of citizens, but also to more efficient consumption of natural resources deemed to be limited.

The third part presents the intelligent solutions for all the core system of the city(a transportation system smarter, faster and more effective interventions in emergencies, a more intelligent management of water and electricity, a more intelligent administration and health and education systems more intelligent one) which will determine urban development.

2. SMART PLANET

During the last centuries, population growth, along with increasingly affluent societies, has resulted in a greater demand for our limited physical infrastructures and natural resources than ever before. In addition, the risks of climate change have heightened the need for more sophisticated ways of controlling carbon emissions (Dirks et al., 2009).

Trillions of digital devices, connected through the Internet, are producing a vast ocean of data. And all this information—from the flow of markets to the pulse of societies (Dirks and Keeling, 2009)—can be turned into knowledge because we now have the computational power and advanced analytics to make sense of it. With this knowledge we can reduce costs, cut waste, and improve the efficiency, productivity and quality of everything from companies to cities.

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Leaders in business, government, and society around the world are beginning to grasp the potential of intelligent systems to facilitate economic growth, improved efficiency, sustainable development, and societal progress. Building a smarter planet must to start from three main ideas (Dirks et al., 2010): instrument the world's systems, interconnect them and make them intelligent.

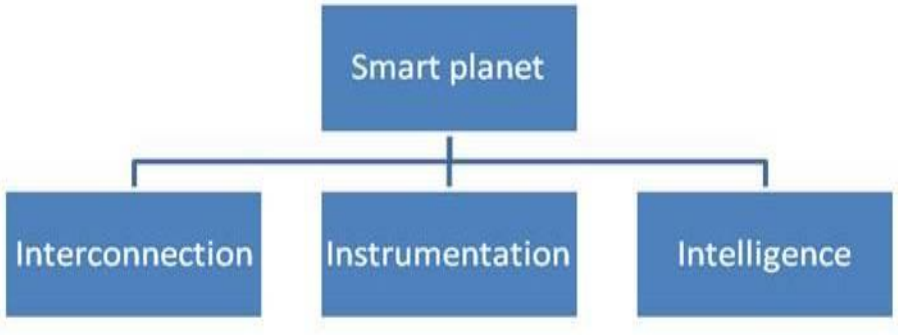

FIGURE 1 – WHAT IS A SMART PLANET?

Instrument the world's systems - First, the world's becoming instrumented. An instrumented world requires a class of information technology systems that combine very large numbers of sensors and actuators with computing platforms for capturing and analyzing such data streams (Dirks et al., 2009).

Interconnect the world's systems - using the solution for instrumented, the world will become interconnected. We can say - any to any - linkage of people, process, and systems. Interconnected means connecting people, systems and objects so that they can they can interact and communicate within themselves freely and in entirely new way.

New computing models can handle the proliferation of end-user devices, sensors and actuators and connect them with back-end systems (Palmisano, 2008) and combined with advanced analytics, those supercomputers can turn mountains of data into intelligence that can be translated into action, making our systems, processes and infrastructures more efficient, more productive and responsive — in a word, smarter.

Make the world's systems intelligent - through instrumented and interconnected solutions the world will become intelligent. Intelligent means being dynamic and this can do by responding to changes quickly and accurately and get better results by predicting and optimizing for future events.

During the last centuries, population growth, along with increasingly affluent societies, has resulted in a greater demand for our limited infrastructures and natural resources than ever before. In addition, the risks of climate change have heightened the need for more sophisticated ways of controlling carbon emissions.

Data is being captured today as never before. It reveals everything from large and systemic patterns (of global markets, workflows, national infrastructures, and natural systems) to the location, temperature, security, and condition of every item in a global supply chain. Through social media, billions of customers, citizens, students, and patients tell us what they think, what they like and want, and what they are witnessing, in real time.

Intelligence, not intuition, drives innovation. But data by itself is not useful. The most important aspect of our society is to know how to use the date efficiently and to take what it is relevant. This will produce knowledge which is the most important thing of an intelligent planet.

We can define knowledge like the full utilization of information and data, coupled with the potential of people's skills, competencies, ideas, intuitions, commitments, motivations and with the facilities of the new technologies. So, the knowledge reflects in fact, a deep using and understanding of information interconnected with smart utilization of technologies.

Knowledge and new technology infrastructure, research, innovation and education are interconnected in a smart planet (figure no.2).

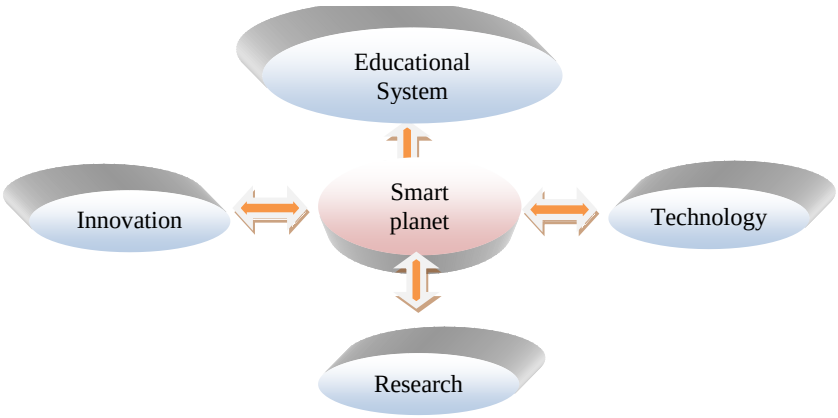

FIGURE 2 – SMART PLANET

Today evolution is based by produce of knowledge and because of this is more important to use efficiently the intelligent solutions and systems.

Technologies have become more widespread, in all levels of our society. The study of smart/intelligent planet concept is significant because it's a quickly growing trend and a lot of researchers consider this a solution for our society. Compared to just a few years ago, when we didn't discuss about this concept this becomes very use in every city and organization.

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3. SMART OR INTELLIGENT SOLUTION FOR CITY

Today's cities, home to more than half the world's population, can be seen as complex networks of components: citizens, businesses, transport, communications, water, energy, city services and other systems. Smarter systems are being implemented and are creating value in every major industry, across every region in both the developed and developing worlds. This idea isn't a metaphor, or a vision, or a proposal—it's a rapidly emerging reality (Dirks et al., 2010)..

Forrester (Washburn and Sindhu, 2010) defines the smart city as: The use of Smart Computing technologies to make the critical infrastructure components and services of a city — which include city administration, education, healthcare, public safety, real estate, transportation, and utilities — more intelligent, interconnected, and efficient. D.C.Chien, Greater China Group, said at the China Smart City Forum by 'smarter city' strategy, we are looking to offer smart solutions to these areas in a way to raise efficiency, cut expenses and make cities more harmonious and eco-friendly (Muyuan, 2011). Pike Research (Pike Research, 2011) defines a smart city as the integration of technology into a strategic approach to sustainability, citizen well-being, and economic development. And IBM sees the smart city like a system of systems with is instrumented, interconnected and intelligent. So, the cities that want to realize the full potential of smart solutions must utilize all dimensions of 'smart': instrumented, interconnected and intelligent. Based on IBM conception to build a smart city we must to have in view these main ideas (Buijsen et al., 2011):

- **Instrumentation -** enables cities to gather more high-quality data in a short time than ever before;
- **Interconnection** creates links among data, systems and people in ways not previously possible;
- **Intelligence** – in the form of new kinds of computing models and new algorithms – enables cities to generate predictive insights for informed decision making and action.

We can say that in our age cities are complex systems—systems of systems. Advancing these systems to be more instrumented, intelligent and interconnected requires a profound shift in management and governance toward far more collaborative approaches. Using intelligent systems in a city we want to improve the quality of life of citizens, but also the efficient use of natural resources deemed to be limited.

A question of our day is how do the cities smarter and what are the step and principles outlined above in the most cost-effective and productive fashion? The answer is to focus initially on four high-impact areas of improvement (Dirks et al., 2010):

- Reduce congestion in transport systems – a smart system for traffic;
- Improve government services and public safety – a smart system for government services;
- Improve education systems – a smart system for education;
- Enable appropriate access to healthcare data for better quality of care – a smart system for health.

In Europe, the *smart grid* and *cloud computing* are often seen as the essential foundation for an entire smart city.

Many cities from Europe are implementing smart cities by starting with a transformation of a vertical, which includes: public safety, education, transportation, water, smart grid, reduced natural energy consumption and is focus on: to be more environmental sustainable, creating new jobs to build economic growth.

On the other hand is China, which building smart cities, are in view the all the core systems of a city. They start to create a strategic development plan for a smart city through surveying, analyzing, summarizing and other methods. In China, many cities have committed themselves to the construction and development of smart city. To build a smart city, they invest in a big number of projects in all categories and they have in view to make new cities. In China smart cities are seen as the solution to their urban growth woes. They start to use the technologies to build greener cities.

4. URBAN DEVELOPMENT

The smart city has been recognized as a new stage of urban development. Its construction has become an international trend, we can have a solution for all the cities, but we can't have the same solution. To implement a smart city we must to have in view density, style and geographical place. This means that technology systems that might work in one city might not be desirable in others.

It may seem basic, but developing a city strategy is both the hardest and most essential step to becoming a smarter city. This strategy (Henderson et al., 2010) will help determine where and when to invest, will articulate key milestones and returns on investment and can help define an integration/optimization calendar across all systems.

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Quality of life and the attractiveness of a city are profoundly influenced by the core/the base systems (figure no.3) of a city (Dirks et al., 2010): transport, government services, education and health.

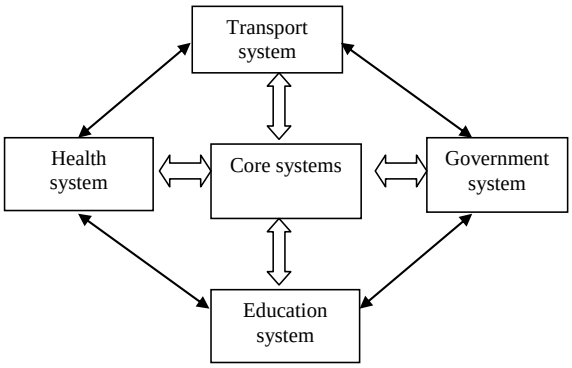

FIGURE 3 – THE CORE SYSTEMS OF THE SMART CITY

Cities can infuse intelligence into their entire transportation system, improving giving better information to city planners, increasing public transportation usage and the productivity of businesses, and raising citizens' quality of life (Lee, 2011).

Applications for an intelligent transportation system:

- Intelligent Traffic Management System
- Intelligent system for the collection of all fees related to motor vehicles

In Bari for example, using a touch screen installed on fishing boats, local fishermen can immediately determine demand in local fish markets that on average handle 100 thousand tons of fish per year. Directly from the boats, using simple touch screen systems, fisherman enter the type of fish caught just minutes ago and instantaneously start a virtual auction with wholesalers on the docks (Armonk,2010).

The University of Bari has also developed systems focused on wine production. Winemakers at up to 60 cooperative wineries are able to determine market demand for various types of wines by accessing the cloud computing-based systems, then package and ship wines demanding the highest price.

Other examples for intelligent transport system (Begawan and Darussalam, 2010): a smart traffic system helped the city of Stockholm reduce traffic by 20%, reduce emissions by 12% and increase public transportation, in Singapore was introduced a smart card for all transport payments. So, we have the same card for parking, car tax and transport

The advantages of a smart transport system are withause number but the most important are: improving quality of life, improving transport system capacity, optimizing routes, streamlining service for drivers, increasing road usage.

The smarter approach to healthcare is one that uses information to create real insight into patient care and organizational performance. Healthcare providers, researchers and directors can work smarter by creating comprehensive, holistic views of patient data. They can get real time visibility into how their operations are running. And they can use wider ranging sample data to achieve more medical breakthroughs.

Applications for an intelligent health system:

- Intelligent system for data integration and its focus on the patient, so that each person have their own information and have access to a team of specialists who can work across the network. Electronic medical record - eliminating paper records made to reduce medical errors and improve efficiency
- Intelligent system that connects doctors, patients and insurance companies
- Electronic Bulletin of medical
- Programming visit / consultation to electronic medical

University Hospital Motol in Prague (Vorisek, 2008) - one of the largest health institutions in the Czech Republic completed the first implementation of Grid Medical Archive Solution Europe: a system that provides secure storage and archiving solution for the patients' medical records least 10 years.

Sainte-Justine Hospital in Quebec (IBM Group, 2009) are using automatic procedures for gathering, managing and updating critical data for research, often scattered in different departments.

Spain Public Health Service (Begawan and Darussalam, 2010) has implemented a regional integrated system that allows patients to go to several health centres in the region, with the certainty that that doctor has access to the complete and updated patient data, thus making treatment faster and more accurately.

Bari has implemented smart health systems which have in view to improve the quality of life for patients, allowing timely diagnosis and therapies and, reducing health care costs, reduce time for access to hospital.

The existences of an intelligent educational system - focuses on the efficient use of existing infrastructure and modernize it where is necessary - considered crucial during an economic crisis when funds are needed for education. But most importantly, a comprehensive education should refocus learning on the two key components of any system of education: student and teacher.

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Through an intelligent educational system, according to the latest data published by IBM in 2010 (IBM Group, 2010a), teachers can analyze student data electronically - from academic results, to information on mobility and presence.

Applications for an intelligent educational system:

- data systems that collect, integrate, analyze and present information on key performance factors such as presence, knowledge and assessment criteria for school transfers;
- education cluster - to involve all stakeholders in the educational preparation of future generations;
- using cloud computing in schools each pupil or student can access the most advanced educational content, software and computing resources and storage.

North Carolina State University provides computing lab resources to schools and colleges throughout the state via a central service. Students, faculty and teachers are able to receive a customized image of the content and applications to meet their learning need (Begawan and Darussalam, 2010).

An intelligent educational system can provide those interested in tools and understanding they need to make smarter decisions at the system level. It can develop data systems that collect, integrate, analyze and present information on key performance factors such as presence, evaluation criteria and transfer knowledge.

Using smart systems to support teaching and to deliver education and training is one way to make some change. This solution will add new dimensions in educational activities (Shehab, 2010) and the graduated students will contribute to the success of their communities.

The benefits of the intelligent educational systems from students can be: understand student attendance patterns, gain a complete view of student progress, quickly identify students at risk, identify strategies to help student to find a job and on the other hand, for the system the benefits can be: accelerate innovation, accelerate knowledge creation, accelerate economic impact of science with powerful tools for researchers.

Education is a basic element in every country's development, and subsequently, smart education could be considered the most effective, reliable and the most modern method in individual and organizational development (Ladan and Ghonoodib, 2011).

For a smart planet we have need smart public services which improve the collaborating across departments and with communities. Across an entire world has many examples of information shared across departments and programs to deliver service and benefits to citizens.

At this time for all countries is essential to analys each urban area of six points of view (Cortada et al., 2008):

1. Changing demographics
2. Accelerating globalization
3. Rising environmental concerns
4. Evolving societal relationships
5. Growing threats to social stability and order
6. Expanding impact of technology.

Have in view this element the governments must first anticipate change by determining which drivers are most critical in light of their own unique set of circumstances. Second, based on those priorities, nations must be proactive, designing and then implementing customized strategies and solutions.

At a country level, for example in the United Kingdom and Singapore (IBM Group, 2009), governments are educating citizens about multiple ways to obtain services and encouraging them to use the most convenient and efficient channels.

Smarter government means collaborating across departments and with communities, helping to promote economic growth and at the most important leval making operations and services truly citizen-centric.

Throught collaborating of all departments with communities the activites will become more transparent and accountable, they can manage resources more effectively, and to give citizens access to information about decisions that affect their lives. In the UK (IBM Group, 2009), Southwest One, an innovative joint venture, is providing shared services by integrating many functions of the Somerset County and in Albuquerque, New Mexico, a business intelligence solution has improved efficiency by 20% in the city's ability to generate reports and keep citizens informed (Barrientos, 2010).

For economic growth smarter government must have in view streamlining cumbersome processes and simplifying reporting requirements, which are especially burdensome to all agencies. The Belgian Crossroads Bank for Social Security has automated 42 services for employers, eliminating 50 social

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security declaration forms. As a result, 23 million declarations were made electronically in 2008 – a major productivity benefit for Belgian businesses, saving them an estimated $1.7 billion a year (IBM Group, 2009).

Many numbers of governments try to integrate their services on the Web. Kyoto, Japan (IBM Group, 2010b), created a Web site that allows all people, regardless of their abilities or native language, to access city information. In our age the challenges in this parte are many and the governments around the world are showing real progress.

5. CONCLUSIONS

In conclusion, the smart system represents a real support for an urban development which will generate a sustainable development of quality of our cities. To improve the quality and performance of cities is recommended to involve all interested parties to implement efficiently smart systems. The city development depends on the evolution and the efficiently uses of the intelligent solutions. In many countries the telecommunications systems infrastructure currently exists, but isn't use to the real value. So, is very important to develop a city strategy is most essential step to becoming a smarter city. This strategy will help determine where and when to invest, because we must to know where and when we can use the smart solutions.

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